HINTERLAND WHO's WHO

CHIPMUNK

Canadian Wildlife Service

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Chipmunk

Chipmunks are the smallest members of the squirrel family. In North America they usually live in or near forest, but some species exist above the timber-line on mountains, or in the semi-desert regions of the western United States where bushes dominate the landscape. They are found as far north as the Yukon and as far south as Mexico; but not on the Arctic tundra, the grasslands of the Great Plains, or in the hot, sub-tropical forests of Florida. Water-logged soils are usually avoided, apparently because they are not good for burrowing.

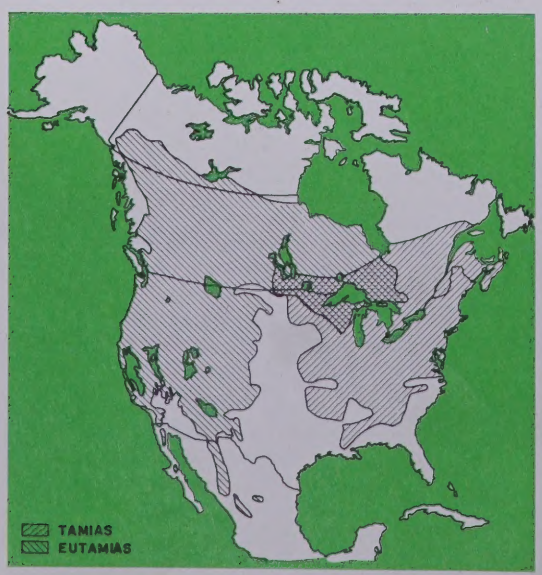
Where they occur, chipmunks can be numerous, especially if the surface of the ground is disturbed by fallen logs, logging roads, ravines, or piles of brush or rock. Chipmunks wander long distances from their burrows when gathering food, and require cover of this kind to escape from predators. If the forest consists of tall, mature trees, with few plants on the shady forest floor, chipmunks will choose forest edges such as streams or clearings, where bushes are more abundant. Mature forests do not provide abundant food and cover for chipmunks.

Chipmunks probably originated in Asia, where they are abundant and widely distributed today. They entered North America by a land connection with Asia across the Bering Sea. This land connection probably appeared and disappeared many times in the last 60 million years, and the present North American chipmunks may be the result of many invasions from Asia.

General appearance

Chipmunks can be easily recognized by the light and dark stripes on the back and head. They may be sometimes confused with some of the ground squirrels, which are also striped; but on these larger squirrels, the stripes are confined to the back and do not continue forward onto the head, as they do on chipmunks.

In North America there are two main kinds of chipmunks: the western chipmunk *(Eutamias)* and the eastern chipmunk *(Tamias)*. Both chipmunks have five dark stripes and four light stripes, but in the eastern chipmunk two of the light stripes on the back are more obvious than, and twice as wide as, any of the other stripes. The fur on the back and sides is coloured in a variety of shades of black, brown, and grey, but on the belly the colour lightens to white or buff.



The eastern chipmunk is large (weight about 3½ ounces) with a relatively short tail (about one-third of the total length), while the western chipmunk is smaller (about 2 ounces) with a relatively longer tail (nearly half of total length). Eastern chipmunks are between 8 and 11 inches long, and western chipmunks are 7 to 10 inches long.

Chipmunks can also be identified by their calls. When surprised, a chipmunk runs quickly along the ground giving a loud, rapid series of chirps and chitters. This sudden burst of noise probably startles predators, helping the chipmunk to escape. Chipmunks also frequently call with a high-pitched chirp, repeated over and over at intervals of one or two seconds. This scolding call is given when the chipmunk is watching an intruder from a safe vantage point, such as a log or tree limb.

Burrows

Chipmunks are burrowing animals and construct tunnels and nests beneath the ground. The entrances of their burrows are usually well concealed beneath rocks or tangled brush.

Only a few chipmunk burrows have ever been dug up by naturalists. Some burrows have tunnels that branch and lead to side-tunnels and accessory chambers. Most burrows, however, consist of a single entrance leading to a single, unbranched tunnel, which slopes gradually to a depth of one-and-a-half to two feet.

At the end of the tunnel is a round nest-chamber about six inches in diameter. In this chamber the chipmunk constructs a nest using insulating material such as dried grasses, shredded leaves, or the fluffy seed heads of certain plants. Seeds are stored beneath the nest and it is in this chamber that the chipmunk spends the coldest part of the winter, curled up on top of its food supply.

Breeding and the production of young

Male chipmunks are the first to emerge in the spring and are usually active as soon as patches of bare ground begin to appear through the snow. The testes of males may be fully developed when they first appear above ground. Females become active one to two weeks later than the males, and breeding begins as soon as the females emerge. In Canada, the chipmunk breeding season is April and May, and most of the breeding is accomplished from mid-April to mid-May. Females alone are responsible for rearing the young. The testes of males decrease in size fol-

lowing the breeding season, and males are usually incapable of breeding by the end of May.

Embryos in the uterus of the female require about 30 days to develop to full term, but this gestation period has never been accurately measured. The usual number of young in one litter is four, five, or six, but litters as small as one and as large as eight have been recorded. In Canada, chipmunks have only one litter and one breeding season per year, but in southern United States both eastern and western chipmunks can produce two litters in a single year.

Growth of the young

Young chipmunks are born naked and blind in an underground nest and weigh between 2.5 and 3.0 grams at birth. Hair does not become visible to the unaided eye until about 10 days of age. The ears are closed until the 28th day, and the eyes first open at 32 days of age.

When they are five or six weeks old, the young chipmunks may begin to leave the burrow to forage on the surface of the ground. At first they are quite unafraid, but after a few days above ground they are more easily alarmed and escape quickly if disturbed. The young grow rapidly during the late summer and reach adult size before the end of September. Some breed in their first spring, others not until their second year.

Dispersal

In the weeks after young chipmunks first leave the nest, they become increasingly adept at locating food and escaping from enemies. Within two to four weeks, each young chipmunk leaves the burrow of its mother and establishes a burrow of its own. Most of this dispersal occurs during August and September, and young chipmunks sometimes travel long distances before finding a suitable home. Movements ranging from a few yards to more than one mile have been recorded. Adult chipmunks, especially males, may live for some months or years in one area, and then move to a new home. Female chipmunks normally spend most of their lives within an area of several acres.

Food habits

A chipmunk spends much of his day collecting and storing seeds, which are his most important source of food. Thin membranous pouches inside the cheeks hold the seeds while the animal is busy collecting. When the cheek pouches become full, the chipmunk deposits the seeds beneath its underground nest, or hides them on the surface of the ground, covering them with leaves and other litter.

In spring, seeds are usually scarce and difficult to find. Chipmunks diligently search the ground surface for any seeds that remain from the previous summer. Green leaves and shoots are eaten in large amounts in spring, but gradually become less important in the diet as new seeds become available in summer. Throughout the spring, summer, and autumn, the diet is supplemented with insects, flowers, fruits, mushrooms, and occasionally, eggs.

When the first ripe seeds appear in mid-summer, chipmunks remove them from the plants and begin to store them underground. The chipmunk holds fruits and seeds with its dexterous front paws, and with the teeth and tongue removes the seeds and shifts them backward into the cheek pouches. The lower incisors are especially long and directed forward. These specialized teeth enable the animal to separate and remove tiny seeds from the pods.

Hibernation

Near the end of July, chipmunks begin to collect large quantities of seeds and store them below ground. By October, each chipmunk has accumulated between one-half and one pint of seeds. With the aid of this food store, the chipmunk survives the winter.

Unlike ground squirrels, chipmunks do not accumulate body fat during the summer months, although some may do so just before they enter hibernation. Consequently, while many ground squirrels are already hibernating in October, chipmunks are still actively storing food.

With the onset of winter in November, chipmunks disappear below ground and hibernation begins. During hibernation, the body temperature, rate of breathing, and rate of heart beat drop to very low levels, reducing the amount of energy required to maintain the chipmunk. Chipmunks are not deep hibernators and are thought to awaken periodically and consume part of their food supply. They have occasionally been seen above ground on warm winter days.

A second view of chipmunk hibernation has more recently been suggested. According to this view, chipmunks do not actually hibernate until their food supply has been completely exhausted. Thus, hibernation may be an emergency survival measure. Only two chipmunks have ever been excavated in winter in a state of hibernation, and neither of these animals had a supply of food. At present, it is not known which view of chipmunk hibernation is correct.

With the first warm spring days of March, chipmunks begin to emerge, sometimes burrowing up through several feet of snow to reach daylight.

Enemies and limiting factors

Chipmunk numbers usually do not vary much from year to year, but local declines and disappearances have been recorded. These mysterious declines have never been satisfactorily explained.

Chipmunks must practise constant vigilance to avoid their many predators, including hawks, weasels, coyotes, martens, foxes, and snakes. Nevertheless, chipmunks generally comprise only a small part of the diet of such predators and the main reason for this is that chipmunks are

not very abundant. No predator can afford to specialize exclusively on chipmunks when mice are more abundant and more easily caught.

In addition, some chipmunks die as the result of wounds received in fights during the breeding season. Defence of territory is not well understood in chipmunks, but females have been observed defending their nests and young against other chipmunks.

Disease and food shortage may also limit the number of chipmunks but, once again, little is known about them. Disease epidemics have not been reported from chipmunks, but are known to occur in populations of mice and other rodents. Since chipmunks are dependent on a store of seeds for winter survival, any failure of these seed crops could jeopardize their survival.

Importance to man

Through their habit of storing seeds beneath the surface litter, chipmunks are important in the dispersal of seeds. Any such partially buried seeds that are not consumed stand a better chance of germination than those falling on top of surface litter. In this way, chipmunks assist the spread of shrubs, trees, and other seed plants.

If chipmunks are very abundant, they can prevent normal reforestation of some evergreen trees, especially pines, by eating the seeds. It is occasionally necessary to control chipmunks and other rodents with poison to ensure adequate germination and growth of seedlings. Poisoning is not a satisfactory means of control, because of the harmful effects on other kinds of wildlife. Beneficial gamebirds and insect-eating songbirds may also be killed by the poison.

Much of the value of chipmunks lies in the pleasure they provide for campers, hikers and anyone who enjoys the country. Our national and provincial parks would be less interesting and less enjoyable without chipmunks dashing across forest trails, or scrounging food in campgrounds.

Reading list

Criddle, Stuart. 1943. The little northern chipmunk in southern Manitoba. Canadian Field-Naturalist 57: 81–86.

Peterson, R. L. 1966. The mammals of eastern Canada. Oxford University Press, Toronto.

How does the Canadian Wildlife Service fit into the national wildlife picture?

The Canadian Wildlife Service carries out both wildlife research and management. As a branch of the Department of Indian Affairs and Northern Development, it is entrusted with federal responsibilities for wildlife, a renewable resource of ever-increasing importance to the national welfare and economy.

Each province has control over the natural resources within its boundaries, including wildlife. However, because Canada signed the Migratory Birds Treaty with the United States in 1916, there is a federal responsibility for the management and protection of migratory birds. The Canadian Wildlife Service administers the Migratory Birds Convention Act and Regulations for the federal government. In practice, federal and provincial governments co-operate in all matters concerning migratory birds. The Canadian Wildlife Service studies migratory birds throughout Canada and conducts scientific research into other wildlife problems in the Northwest Territories, the Yukon Territory, and Canada's National Parks; it also co-operates with administrative agencies when wildlife management programs indicated by research are instituted.

The Wildlife Service staff includes mammalogists, ornithologists, limnologists, pathologists, a biometrician and a pesticides unit. The head office is in Ottawa and there are regional offices in Edmonton and Ottawa. Smaller offices are located across Canada, from Whitehorse, Yukon Territory, to St. John's, Newfoundland.

The Service administers over 90 migratory bird sanctuaries throughout Canada. It is now participating with the provinces in a major program of preserving, by purchase and long-term lease, wetlands necessary to migratory birds for breeding and for resting during migration.

A National Wildlife Policy and Program was announced on April 6, 1966, that provides for expanded research and management in co-operation with the provincial game agencies and other interested organizations.

For further information on wildlife in your province, please contact the director of your provincial fish and wildlife department.

Written for the Canadian Wildlife Service by David Sheppard. Photo of western chipmunk by Hans Dommasch.

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